

CLAIMS

1. A method of mass spectrometry comprising a plurality of cycles, each cycle comprising the steps of:
 - 5 (a) preparing ions to be analysed by a mass spectrometer;
 - (b) using a detector of the mass spectrometer to collect data from the ions prepared in step (a); and
 - (c) processing the data collected in step (b) with
- 10 processing means;
wherein at least a part of step (a) and/or a part of step (b) of a cycle is performed concurrently with part (c) of a previous cycle.
- 15 2. A method according to claim 1, comprising the step of starting step (a) of a cycle upon completion of step (b) of the previous cycle.
3. A method according to claim 1, comprising the step
- 20 of starting step (a) of a cycle during step (b) of the previous cycle.
4. A method according to claim 3, comprising the step of starting step (b) of a cycle upon completion of step
- 25 (b) of the previous cycle.
5. A method according to any preceding claim, comprising the step of controlling step (a) and/or step (b) of a cycle in response to data processed in step (c)
- 30 of a previous cycle.

6. A method according to any preceding claim, wherein
step (b) further comprises making available a sample of
data collected during an initial period of step (b) for
processing in part (c) while the remainder of the data
5 collection of step (b) continues.

7. A method according to claim 6, comprising the step
of controlling step (a) and/or step (b) of a cycle in
response to a sample of data processed in step (c) of a
10 previous cycle.

8. A method according to claim 7, wherein the mass
spectrometer is a hybrid spectrometer comprising first
and second detectors, the method further comprising the
15 step of injecting ions into the first detector from the
second detector in response to the sample of data
processed in step (c).

9. A method according to claim 8, wherein the first
20 detector is part of an ICR cell and the second detector
is part of an ion storage device.

10. A method according to claim 9, comprising the steps
of collecting a full mass spectrometry scan with the
25 first detector and performing a MS^n scan with the second
detector.

11. A method of mass spectrometry comprising a plurality
of cycles, each cycle comprising the steps of:
30 (a) preparing ions to be analysed with a mass
spectrometer;

(b) using the mass spectrometer to collect data from the ions prepared in step (a); and

(c) processing data collected in step (b);

wherein a sample of the data collected during an
5 initial period of step (b) is processed concurrently with the remainder of the data collection of step (b) and is used to control step (a) and/or step (b) of a subsequent experiment.

10 12. A method according to claim 11, wherein the mass spectrometer is a hybrid spectrometer comprising first and second detectors and wherein the sample of data is collected in the first detector and, once processed, is used to control step (a) and/or step (b) of a subsequent
15 experiment performed with the second detector concurrently with collection of the remainder of the data by the first detector.

13. A method according to claim 12, comprising the steps
20 of collecting a full mass spectrometry scan with the first detector and performing a MSⁿ scan with the second detector.

14. A method according to claim 12 or claim 13, wherein
25 at least step (a) and/or step (b) of a cycle is performed concurrently with part (c) of the previous cycle.

15. A method of mass spectrometry comprising the steps
of:
30 (a) preparing ions to be analysed by a mass spectrometer;

(b) using a first detector of the mass spectrometer to perform a full mass spectrometry scan of the ions prepared in step (a);

(c) preparing further ions to be analysed by the mass spectrometer; and

(d) using a second detector to perform a MS^n scan of the ions prepared in step (c);

wherein step (c) and/or step (d) is preformed concurrent with step (b).

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16. The method of claim 15, wherein step (b) comprises using an ICR cell as the first detector.

17. The method of claim 15 or claim 16, wherein the second detector is located in an ion storage device.

18. The method of claim 15, further comprising the steps of:

storing the ions prepared in step (a) in an ion storage device;

transferring the stored ions to an ICR cell;
using the ICR cell to detect the ions transferred thereto as step (b);

storing the further ions prepared in step (c) in the ion storage device; and

using detector provided in the ion storage device as the second detector to detect the stored further ions as step (d).

19. A method of mass spectrometry according to any preceding claim, wherein the mass spectrometry is any one of Fourier transform ion cyclotron resonance mass

spectrometry, Fourier transform Orbitrap mass spectrometry or quadrupole time of flight spectrometry.

20. A computer program comprising program instructions
5 operable to carry out the method of any preceding claim.

21. A computer when programmed with the computer program of claim 20.

10 22. A computer readable medium having the computer program of claim 20 recorded thereon.